Total Dissolved Gas Fixed Monitoring Station System

Report from the Water Quality Team Subgroup

The Fixed Monitoring Station (FMS) Subgroup of the Water Quality Team (WQT) met on Thursday, February 14, 2002 to complete review of the FMS system for the Federal Columbia River Power System (FCRPS). The results reported below apply to the 2002 spill season. The review effort has revealed some monitoring issues related to forebay instrument placement which will require more work during the next year.

At the start of the February 15th meeting the group reviewed the four criteria used to evaluate each of the FMS sites. These criteria are repeated below. The subgroup's efforts have already considered the FMS's associated with Bonneville, The Dalles, and John Day dams. The remainder of the FCRPS projects, i.e., McNary to Lower Granite required participation from the Walla Walla Corps (not available at earlier meetings) and were reviewed at Thursday's session. The complete recommendation of the subgroup are reported in the table below.

Fixed Monitoring Station	**Recommendation/Comments**
Camas/ Washougal	Station will continue and be used in spill management decisions.
Corbett	Station will be added in this vicinity. It will consist of a data logger serviced every two weeks. Efforts will be made to provide NMFS with data more frequently to aid in evaluations. If funding allows the Corbett station could be instrumented and added to the system.
Skamania.	Station will be terminated, current pattern in area affects data. Data from station are not used in river management.
Warrendale	Station will continue in service.
BON Forebay	Station will continue in service.
TDA Tailrace	Station will continue in service.
TDA Forebay	Station at east end of powerhouse will continue and be used in spill management decisions. A new station will be added at the west end of the powerhouse. It will consist of a data logger serviced every two weeks.
JDA Tailrace	Station will continue in service.

JDA Forebay	Station exhibits problems associated with warming and vertical density gradients. The subgroup concluded that the existing station will continue in service and be used in spill management in 2002. In addition the test of proposed solution discussed below will be explored.
MCN Tailrace	Station will continue in service.
MCN Forebay	Both existing forebay stations (north side at lock and south side of powerhouse) exhibit problems associated with warming and vertical density gradients. The subgroup concluded that the existing stations will continue in service and be used in spill management in 2002. Discussions of corrective actions, studies will be pursued.
IHR Tailrace	Station will continue in service.
IHR Forebay	Station exhibits problems associated with warming and vertical density gradients. The subgroup concluded that the existing station will continue in service and be used in spill management in 2002. In addition the test of proposed solution discussed below will be explored.
LMO Tailrace	Station will continue in service.
LMO Forebay	Station exhibits problems associated with warming and vertical density gradients. The subgroup concluded that the existing station will continue in service and be used in spill management in 2002. In addition the test of proposed solution discussed below will be explored.
LGS Tailrace	Station will continue in service.
LGS Forebay	Station exhibits problems associated with warming and vertical density gradients. The subgroup concluded that the existing station will continue in service and be used in spill management in 2002. In addition the test of proposed solution discussed below will be explored.
LGR Tailrace	Station will continue in service.

LGR Forebay	Station exhibits problems associated with warming and vertical density gradients. The subgroup concluded that the existing station will continue in service and be used in spill management in 2002. In addition the test of proposed solution discussed below will be explored.
DWK Tailrace	Station will continue in service. Required by IDEQ.
Peck	Station will continue in service. Required by IDEQ.
Lewiston	Station will continue in service. Required by IDEQ.
Anatone	Station will continue in service. Required by IDEQ.

Proposed Solution

The problem with the location of the JDA forebay monitoring station is shared with other forebay monitors upriver from the project. Similar problems with water temperature affecting the TDG readings are experienced at MCN, IHR, LMO, LGS, and LGR. Two solutions to these problems were discussed. Both solutions have merit and will be explored.

Relocation of the monitoring probe to a position free from the surface warming due to solar input and summer air temperatures could eliminate or drastically minimize the influence of the major environmental factor, i.e. water temperature spikes. One possible location to be explored would be the project scroll cases. A simple relocation of the instrument internal to the powerhouse where access to the scroll case water would allow sampling of forebay waters being drawn from portions of the reservoir water column not significantly affected by solar energy. This assumes that this water would be more representative of waters experienced by fish migrating through the system. Joe Carroll will investigate the feasibility of installing a test system at the JDA powerhouse for the upcoming season.

Criteria used in FMS evaluation

1. Fish experience - the water quality information musty be representative of likely habitat used by migrating anadromous salmon.

2. Data consistency - reliable, FMS is serviceable, performance is predictable

3. Real-time basis for spill and river management - Data must be relevant to spill management decisions-making.

4. Project releases affect water quality - Alterations in project operations, spill increases/decreases are detected by the FMS instrument.

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1. With regard to the scroll case sampling of TDG, what happens if you only have one monitor/project when that turbine is taken out of service?.

2. If the water temperature is the source of TDG variation , why can't we simply move move the probes to 60' from 15'? Thus avoid the effects of elevated temperatures?

Total Dissolved Gas Fixed Monitoring Station System

Report from the Water Quality Team Subgroup

The Fixed Monitoring Station (FMS) Subgroup of the Water Quality Team (WQT) met on Tuesday November 12, 2002 to complete the review of the FMS system for the Federal Columbia River Power System (FCRPS). The results reported below apply to the 2003 spill season and serve to record the discussion and decisions made during the course of the meeting.

Fixed Monitoring Station	**Recommendation/Comments**
Camas/ Washougal	Continue the CWMW site with additional exploratory monitoring for the Corbett site(see below).
Corbett	Continue the exploratory efforts at the Corbett site with consideration of Corbett replacing CWMW as the downstream site for BON. .
Warrendale	The site is inconsistent with other tailwater sites in the system due to considerable mixing. Recommend eventual retirement of this site.
BON Tailrace	Consider relocation of Warrendale tailwater monitor to the BON spillway channel. NOAA Fisheries (NMFS) is reviewing the 2002 BON spill test TDG data prior to a final decision on this recommendation
BON Forebay	Recommend no change in this site.
TDA Tailrace	The station is currently inconsistent with other tailwater sites in the system due to considerable mixing with powerhouse flows. Recommend addition of an exploratory site in spill water on the north shore and within 1000 feet of the spill water but beyond aerated flow. NOAA Fisheries (NMFS) is reviewing the 2002 BON spill test TDG data prior to a final decision on this recommendation
TDA Forebay	.There are potential benefits in relocation of this site to the provisional site on the opposite end of the structure. Recommend continuing the TDA site with consideration of relocating.
JDA Tailrace	Recommend no change in this site.

JDA Forebay	Recommend continue with current sampling location and depth but recognize that some elevated readings for TDG are temperature induced. Expand exploratory sampling to added locations in the tailwaters of the powerhouse or draft tube deck location. Expand exploratory sampling to a deeper depth at the current locations in the forebay and to an upstream location adjacent to the BRZ and at depths greater than 20 ft. Recommend continued thermal profiling in the JDA forebay water.
MCN Tailrace	Recommend no change in site location. Site anchoring system in need of repairs.
MCN Forebay	Recommend expansion of exploratory investigations of the MCN forebay stations.
Pasco	Recommend no change in this site.
IHR Tailrace	Recommend no change in this site. Site installation recently upgraded with stronger, larger diameter pipe and anchoring as required.
IHR Forebay	See Forebay Fixed Monitoring Station Review discussion below
LMO Tailrace	Recommend no change in this site. Site installation recently upgraded with stronger, larger diameter pipe and anchoring as required.
LMO Forebay	See Forebay Fixed Monitoring Station Review discussion below
LGS Tailrace	Recommend no change in this site. Site installation recently upgraded with stronger, larger diameter pipe and anchoring as required.
LGS Forebay	See Forebay Fixed Monitoring Station Review discussion below
LGR Tailrace	Recommend no change in this site. Site installation recently upgraded with stronger, larger diameter pipe and anchoring as required.

LGR Forebay	.See Forebay Fixed Monitoring Station Review discussion below
DWK Tailrace	Recommend upgrading station to standards of the FMS system. Determine if station is sampling mixed waters from DWK project.
Peck	Site installation recently upgraded with stronger, larger diameter pipe.
Lewiston	Station to modified to correct existing problems with dewatering during low flow conditions.
Anatone	Site installation recently upgraded with stronger, larger diameter pipe and extended 150 feet further into the thalweg and beyond influence from the Grand Ronde discharges.

Forebay Fixed Monitoring Station Review

A multi-year plan to review and evaluate the forebay fixed monitoring stations within the Walla Walla District, Army Corps of Engineers will be implemented in FY 2003. The project will include the following tasks at each of the Lower Snake River projects, i.e., Lower Granite, Little Goose, Lower Monumental and Ice Harbor and two forebay stations at McNary dams. The following tasks will be included:

Review and analysis of existing data from the forebay fixed monitors for representativeness and anomalies in total dissolved gas and temperature.

2. Evaluate and compare auxiliary sites at each project for performance and representativeness. Candidate sites are as follows:
   - One site in powerhouse release possibly located on the after deck or draft tube deck for each project
   - One site inside the powerhouse inline with waters flowing through the structure. A possible point os sample would be plumbed to either a generator penstock, fish unit penstock, cooling water supply etc.
   - Adjacent to the current fixed monitor in the forebay of the project but at an alternate depth